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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/577,951

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Yasuhiro Araki

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YOUNG & THOMPSON
209 Madison Street
Suite 500
Alexandria, VA 22314

EXAMINER

GRAHAM, CHANTEL LORAN

ART UNIT

PAPER NUMBER

1797

NOTIFICATION DATE

DELIVERY MODE

11/12/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DocketingDept@young-thompson.com

Office Action Summary	Application No. 10/577,951	Applicant(s) ARAKI ET AL.	
	Examiner CHANTEL GRAHAM	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6 and 8-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6 and 8-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment filed 7/1/2009 has been entered and fully considered.
2. Claims 5 and 7 have been canceled.
3. Claims 1 and 6 have been amended.
4. Claims 1-4, 6 and 8-16 are pending and have been fully considered.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-4, 6 and 8-11 are rejected under 35 USC 103 (a) as being obvious over SAITOU ET AL. (US PG PUB 20030213728), and in view of MATSUMOTO ET AL. US PG PUB 20030023120). Hereby referred to as SAITOU and MATSUMOTO.

Regarding claims 1-4, 6, 8-9 and 11, SAITOU teaches a method for producing gasoline composition having a sulfur content of 1 ppm or less (abstract) and a research octane number of 89.0 or more (abstract and TABLES), comprising a desulfurization step of

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subjecting a cracked naphtha fraction (para 64) having a 5 vol % distillation temperature of 25.degree. C. or more, a 95 vol % distillation temperature of 210.degree. C. or less (abstract and para 14), an olefin content of 35 vol% or less **(an olefin content of 10 vol% or more; an olefin content of 5 mass% or more)** (abstract), and a diene value of 0.3 g/100 g or less to a desulfurization treatment (see Table 4), and a blending step of mixing the resulting desulfurized cracked naphtha fraction with another gasoline base materials (para 64 and Table 4). A diene-reducing step of reducing the diene content of the raw cracked naphtha fraction by causing the cracked naphtha fraction to come into contact with a diene-reducing catalyst in advance (para 64); and a vapour pressure of 0.098 MPa or less **(the desulfurization treatment causing the cracked naphtha fraction to come in contact with a porous desulfurization agent having a sulfur sorption function in the presence of hydrogen under hydrogen partial pressure of 1MPa or less)** (para 28).

SAITOU does not explicitly teach the concentration of naphtha fraction with another gasoline base material; however MATSUMOTO does. MATSUMOTO teaches a method and composition of gasoline (para 1) containing deeply desulfurized light naphtha (abstract) obtained by hydro-refining and nickel (nickel) type adsorption cracking agent (para 55) having a sulphur concentration of 1 ppm or less (para 64); and the DHN and DLN in a fuel oil composition of 30 and 70 vol % respectively; and an octane number of 89 or more, see arguments above (see also TABLE 2).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the gas composition of SAITOU; by incorporating method and composition of MATSUMOTO.

The motivation would have been to produce a dual purpose fuel for use in both an automotive spark ignition engines and a fuel cell system as taught by SAITOU (para 8).

Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Regarding claim 10, modified SAITOU in view of MATSUMOTO teaches distilling crude oil by means of a normal pressure distillation unit, to thereby yield a light naphtha fraction before additional processing takes place (a pretreatment step) (para 23).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 12-16 are rejected under 35 USC 103 (a) as being obvious over SAITOU ET AL. (US PG PUB 20030213728), in view of MATSUMOTO ET AL. (US PG PUB 20030023120), in view of COKER ET AL. (US PATENT 6913688), and as evidence by FLETCHER ET AL. (US PATENT 5352354). Hereby referred to as SAITOU, MATSUMOTO, COKER, and FLETCHER.

11. Claims 1-4, 6 and 8-11 of 103 (a) rejection above is hereby incorporated.

Regarding claims 12, 13, 14, 15 and 16, SAITOU teaches an octane number of 89.0 or more, a 50 vol % distillation temperature of 105.degree. C. or less, an olefin content of 10 vol % or more, a total sulfur content of 1 ppm or less (see argument above); and a boiling point of 35-100 degree C (see TABLE 4).

SAITOU does not explicitly teach a thiophene compound to the sulfur compounds of 50% or more of sulfur; however it is inherently taught by FLETCHER. FLETCHER teaches an olefinic sulfur-containing (2-methylthiophene) compound has a sulfur content of at least 50 ppmw (see claims 1 and 17).

SAITOU does not explicitly teach olefins of 90 vol % or more; however COKER does. COKER teaches at least about 5% concentrations of olefins (see claim 9).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the gas composition of SAITOU; by incorporating olefin concentrations of COKER.

The motivation would have been to produce a dual purpose fuel for use in both an automotive spark ignition engines and a fuel cell system as taught by SAITOU (para 8).

Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Response to Arguments

12. Applicant's arguments filed 7/1/2009 have been fully considered but they are not persuasive.

Applicant argues:

SAITOU does not disclose:

- a cracked naphtha fraction having a 5 vol% distillation temperature of 25°C or more, a 95 vol% distillation temperature of 210°C or less, an olefin content of 5 mass% or more and a diene value of 0.3g/100g or less,

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- a desulfurization treatment which causes the cracked naphtha to come on contact with a porous desulfurization agent having a sulfur sorption function in the presence of hydrogen under hydrogen partial pressure or 1 MPa or less, or
- a method for producing the unleaded gasoline composition having a sulfur content or 1 mass ppm or less by using 25--90 vol% of a desulfurized cracked naphtha fraction.

Instead, SAITOU teaches that cracked gasoline or light catalytic cracked gasoline can be desulfurized by hydrotreating, adsorption in paragraph [0064], etc. The cracked gasoline is obtained by subjecting heavy oil to the fluid catalytic cracking process, and the light cracked gasoline is obtained by distillation of cracked gasoline. The properties of the cracked gasoline are described as composition *i0 and *ii in Table 4 (The Official Action appears to have mistakenly referred to composition "13).

Examiner respectfully disagrees and maintains the rejection referenced above:

The Examiner is of the position that the claimed invention would have been obvious because all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art.

SAITOU is relied on to teach a method for producing gasoline composition having a sulfur content of 1 ppm or less, a research octane number of 89.0 or more comprising a desulfurization step of subjecting a cracked naphtha fraction having a 5 vol % distillation temperature of 25.degree. C. or more, a 95 vol % distillation temperature of 210.degree. C. or less, an olefin content of 35 vol% or less, a diene value of 0.3 g/100 g or less to a desulfurization treatment, and a blending step of mixing the resulting desulfurized cracked naphtha fraction with another gasoline base materials. A diene-reducing step of reducing the diene content of the raw cracked naphtha fraction by causing the cracked naphtha fraction to come into contact with a diene-reducing catalyst in advance; and a vapour pressure of 0.098 MPa or less. Examiner agrees that SAITOU teaches said composition in TABLE 4 composition 10 and 11, shows gasoline with naphtha fractions. The examiner is of the

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position a reference is good not only for what it teaches but also for what one of ordinary skill might reasonably infer from the teachings. *In re Opprecht* 12 USPQ 2d 1235, 1236 (CAFC 1989); *In re Bode* USPQ 12; *In re Lamberti* 192 USPQ 278; *In re Bozek* 163 USPQ 545,549 (CCPA 1969); *In re Van Mater* 144 USPQ 421; *In re Jacoby* 135 USPQ 317; *In re LeGrice* 133 USPQ 365; *In re Preda* 159 USPQ 342 (CCPA 1968). In addition, "A reference can be used for all its realistically teachings and is not limited to the disclosure in its preferred embodiments" See *In re Van Marter*, 144 USPQ 421.

Applicant argues:

However, SAITOU does not disclose a diene value of these cracked gasolines, or in any examples of their desulfurization. Instead, SAITOU simply uses the cracked gasolines as gasoline base material for a fuel in Table 5. The diene value of the cracked gasoline is generally more than 0.3g/100g, as shown by the value of catalytically cracked gasoline A, D and E being in the range of 0.6--1.6g/100g (See Tables 1 and 2 of the present specification).

Therefore, the diene value of Table 4 compositions *i0 & *ii in SAITOU is presumed to be more than 0.3g/100g because a diene-reducing treatment was not carried out on these compositions. If the diene value is more than 0.3g/100g, the desulfurization performance of the porous desulfurization agent is impaired, resulting in difficulty of desulfurizing sulfur compounds, particularly, thiophene compounds. In addition, as shown in paragraphs 0051--0054 and Table 4 in the present specification, the diene value is not reduced by desulfurization using a porous desulfurization agent. MATSUMOTO fails to remedy these shortcomings of SAITOU for reference purposes. MATSUMOTO teaches that deeply desulfurized light naphtha can be produced by desulfurization of desulfurized light naphtha, for example, through a hydro-refining method, followed by desulfurization by use of a nickel-based adsorption desulfurizing agent [0055]. MATSUMOTO, however, does not teach applying the desulfurization process to a cracked naphtha fraction. MATSUMOTO discloses an adsorption desulfurization wherein the deeply desulfurized light naphtha C having a sulfur content 0.008 wt. ppm was obtained by desulfurization of the deeply desulfurized light naphtha B having a sulfur content 0.1 wt. ppm using a nickel-based adsorption desulfurizing agent [0105]. But, unlike the invention according to claim i, this desulfurization was not carried out in the presence of hydrogen under hydrogen partial pressure of 1 MPa or less. Indeed, since the desulfurization of the present invention is carried out in the presence of a small amount of hydrogen, it can be efficiently done without hydrogenation of olefins.

Examiner respectfully disagrees:

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SAITOU teaches in paragraph 70-73, 64 and 68-69, reforming a fuel and obtaining products of mainly hydrogen by treating with a catalyst such as nickel or copper. Although SAITOU does not specifically teach hydro-refining and a diene-reducing catalyst, this reference does in fact teach reforming a fuel with in the presence of a catalyst such as nickel or copper (see arguments above) and it is the examiners position that the reforming a fuel is equivalent to hydro-refining and the catalyst is equivalent to a diene-reducing catalyst; and burden is upon applicants to show evidence otherwise.

Applicant argues:

The present invention can reduce the sulfur content to 1 mass ppm or less and leave olefin content unchanged by desulfurizing the cracked naphtha fraction having an olefin content of 5 mass% or more, which has high octane number, by using a porous desulfurization agent in the presence of a small amount of hydrogen after reducing diene content to a diene value of 0.3g/100g or less. In contrast, MATSUMOTO does not show how to desulfurize an olefin-containing fraction without reducing olefins. There would have been no motivation to apply the desulfurization agent used for the deeply desulfurized light naphtha having a small amount of olefins and aromatics to the cracked naphtha fraction having a large amount of olefins and aromatics (see Tables in the present specification). Therefore, the invention described in claims 1-4, 6 and 8-11 is not obvious over SAITOU in view of MATSUMOTO, and withdrawal of the rejection is respectfully requested.

MATSUMOTO teaches a fuel using deeply desulfurized naphtha consisting of C4 to C7 normal paraffin, iso--paraffin, naphthene, etc. and hardly containing olefin and aromatics. Accordingly, even if one were to combine SAITOU's fuel with MATSUMOTO's fuel, one would not arrive at the claimed fuel composition of the present invention.

Examiner respectfully disagrees:

MATSUMOTO is relied on to teach the concentration of naphtha fraction with another gasoline base material, a pretreatment step of distilling crude oil by means of a normal pressure distillation unit before additional processing takes place (see rejection above).

The examiner has established a clear prima facie case of obviousness and burden is shifted to applicants to establish clear proof as to why one skilled in the art would not or could not, under any circumstances, be motivated to substitute (1) functionally equivalent method and/or (2) substitute one conventionally known component for another that is to be used for the same purpose.

Applicant argues:

SAITOU teaches a fuel having a research octane number of 89.0 or more, a 50 vol% distillation temperature of 60°C or higher and 120°C or lower, an olefin content of 35 vol% or less, and sulfur content of 50 mass ppm or less. However, SAITOU does not teach having a proportion of thiophene compounds to the total sulfur compounds of 50 mass% or more, as sulfur.

Examiner respectfully disagrees:

SAITOU is not relied upon to teach a thiophene, as discussed above; however FLETCHER is relied on to teach an olefinic sulfur-containing (2-methylthiophene) compound has a sulfur content of at least 50 ppmw (see rejection above).

Applicant argues:

The gasoline composition of claim 12 of the present invention recites a research octane number of 89.0 or more, a 50 vol% distillation temperature of 105°C or less, an olefin content of 10 vol% or more, and sulfur content of 1 mass ppm or less is encompassed by the composition suggested by SAITOU. However, the composition of claim 12 makes a selective invention over SAITOU. That is, SAITOU does not disclose any working example of a fuel which satisfies all the limitations of claim 12 (see Table 5 in SAITOU). Specifically, none of the fuels has an olefin content of 10 vol% or more. Further, SAITOU fails to disclose or suggest the content of thiophene compounds as sulfur.

Examiner respectfully disagrees:

Applicant agrees that SAITOU teaches “The gasoline composition of claim 12 of the present invention recites a research octane number of 89.0 or more, a 50 vol% distillation temperature of 105°C or less, an olefin content of 10 vol% or more, and sulfur content of 1 mass ppm or less is encompassed by the composition suggested by SAITOU”; however

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applicant argues that SAITOU does not disclose an olefin content of 10 vol% or more.

Examiner respectfully disagrees SAITOU teaches in the abstract an olefin content of 35 vol% or less. In view of this data, the examiner's position is that the ranges overlap or encompass the claimed ranges. "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

Applicant argues:

FLETCHER does not remedy the shortcomings of the combination of SAITOU and MATSUMOTO for reference purposes. FLETCHER teaches an olefinic sulfur-containing compound which has a sulfur content of at least 50 ppm (see claims 1 and 17), but does not mention the olefinic sulfur--containing compound is 2-- methylthiophene. A thiophene is a cyclic sulfur compound, and it is clear that FLETCHER regarded thiophene to be a cyclic sulfur compound from the phrase, JJ... thiophene and other cyclic sulfur compounds in column 4, lines 62-64. However, the proportion of thiophene compound to the sulfur compounds of 50% or more or the amount of sulfur is not inherently taught by FLETCHER, as alleged in the Official Action. That is, one cannot calculate a proportion or the amount of thiophene compound when the total amount of sulfur is unknown. Accordingly, this allegation is groundless. Furthermore, COKER also cannot remedy the deficiencies of SAITOU and MATSUMOTO for reference purposes. COKER teaches a process for hydrodesulfurizing olefinic naphtha feedstreams and retaining a substantial amount of the olefins. The feedstreams contain at least about 5 wt. % olefins. A product stream contains at least 5.0 wt. ppm sulfur. However, COKER does not teach the amount of olefins in the product which has a sulfur content of 1 mass ppm or less. Therefore, the present invention as defined by claims 12--16 is not obvious over SAITOU in view of MATSUMOTO and COKER, and as evidenced by FLETCHER, and withdrawal of the rejection is respectfully requested.

Examiner respectfully disagrees:

FLETCHER teaches as set forth in the arguments above. COKER is relied on to teach at least about 5% concentrations of olefins (see rejection above).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

13. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

14. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHANTEL GRAHAM whose telephone number is (571)270-5563. The examiner can normally be reached on M-Th 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Marcheski can be reached on 571-272-1374. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system,

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contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CHANTEL GRAHAM/
Examiner, Art Unit 1797

/Ellen M McAvoy/
Primary Examiner, Art Unit 1797